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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/672,013

09/26/2003

Seong Deok Ahn

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07/13/2006

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EXAMINER

BUEKER, RICHARD R

ART UNIT

PAPER NUMBER

1763

DATE MAILED: 07/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/672,013

Applicant(s)

AHN ET AL.

Examiner

Richard Bueker

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 April 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6 and 8-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6 and 8-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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Claims 1-4, 6 and 8-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claims 1 and 11, in the newly added phrase "combining diluted gas with the transfer gas before entering the process chamber and after the transfer gas leaving the source chamber" the word "leaving" is non-idiomatic, vague and indefinite.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4 and 6 and 8-12 are rejected under 35 U.S.C. 103(a) as obvious over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790).

Jurgensen I (WO 01/61071) and Jurgensen (US 2003/0054099) are patent family equivalents and Jurgensen (US 2003/0054099) is used in this office action as an English translation for Jurgensen I (WO 01/61071). Jurgensen II (WO 02/27064) and Jurgensen (US 2003/0192471) are patent family equivalents and Jurgensen (US 2003/0192471) is used in this office action as an English translation for Jurgensen II (WO 02/27064).

Jurgensen I (see Figs. 1-6) discloses an apparatus for vapor phase deposition including process chamber, temperature controlled substrate holder, showerhead, source chambers for generating organic source vapors, transfer gas (i.e. carrier gas)

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source and a source heater for evaporating source material in the source chamber.

Regarding claim 3, Jurgensen I (see Fig. 8) and Jurgensen II (see Figs. 2 and 3) both teach the use of a vaporizer having the transfer gas line extending into the source chamber. Regarding the purging step in claim 11, Jurgensen teaches (paragraphs 44 and 45) the step of providing a further feed line to feed carrier gas to the showerhead to purge the showerhead plenum when switching precursor streams. Also, Jurgensen's three-way valve 43 of Fig. 8 automatically switches carrier gas into the chamber supply line 6 when source gas flow is terminated.

Regarding the claim 1 and claim 11 recitation of a conic block or conic plate transfer gas distributor, Jurgensen II teaches the use of a source chamber with a conic gas distributor plate to supply source gas to a vapor coating chamber. It is noted that the vaporizer of Jurgensen II is equivalent to that of DE 10048759 that is cited in paragraph 47 of Jurgensen I. In the source chamber of Fig. 4 of Jurgensen II, the apex of the conic plate is pointing towards the gas port 11, which Jurgensen describes as an outlet of the vessel 2 (see para. 18 of Jurgensen II). It is noted, however, that the port 11 is also an inlet to the pipe leading to the coating chamber, and transfer gas enters the port 11, and therefore port 11 is "a transfer gas inlet" as recited in claim 1, and the apex of the conic block or plate 16 is "pointing towards the transfer gas inlet" 11. It would have been obvious to use the vaporizer of Jurgensen II in the apparatus of Jurgensen I, because the vaporizer of Jurgensen II is equivalent to that of DE 10048759 that is cited in paragraph 47 of Jurgensen I. Also, Gartner (see Fig. 3) teaches a vaporizer for vaporizing organic source vapors that is analogous to the vaporizer of

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Jurgensen II. Gartner's Fig. 3 vaporizer includes a conic block or conic plate 10, with its apex pointing towards the transfer gas inlet 6. Gartner (see col. 9, lines 23-44) teaches that his Fig. 3 vaporizer has desirable characteristics such as eliminating the formation of large cavities in the organic precursor powder, and also providing a better efficiency and flow constant. It would have been obvious to one skilled in the art to use the organic precursor vaporizer of Fig. 3 of Gartner as the organic vapor source in the apparatus of Jurgensen I in order to gain the desirable benefits of better efficiency and flow constant as taught by Gartner.

Regarding the newly recited "diluted gas supply source" of claim 1, it is noted that apparatus claim 1 fails to include any recited apparatus structure for connecting the recited diluted gas supply source to the other recited parts of the apparatus. The phrase "from which diluted gas is supplied to combine with the transfer gas before entering the process chamber and after the transfer gas leaving the source chamber in order to control the process chamber" is a recitation of intended use of the recited diluted gas supply source. As such, this recitation of intended use does not so limit the apparatus of claim 1. Regarding the newly recited limitation of process claim 11, it is noted that Jurgensen I (see paragraphs 71 to 73 of US 2003/0054099) teaches that the tanks 1, 3 of Figs. 1 and 5 may be directly substituted for by the vaporizer of Fig. 8 or the vaporizer of DE 10048759.9 (which is the Jurgensen II vaporizer). The vaporizer of Fig. 8 of Jurgensen I includes a carrier gas (i.e. transfer gas) feed pipe 42 connected to the vaporizer, and a second carrier gas (i.e. diluting gas) feed pipe 35 which is connected to the vapor outlet pipe 6. Furthermore, Jurgensen I (see para. 73) clearly

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teaches that the carrier gas 35 is intended to dilute the vapor in line 6 in order to reduce the partial pressure of the vapor and thus reduce the temperature that is required to prevent condensation of vapor in line 6. It is noted that this teaching is also directly applicable to the solid source vaporizer of Jurgensen II (i.e. DE 10048759.9) or Gartner. Therefore, it would have been obvious to one skilled in the art to connect a diluting gas source of the type illustrated as 35 in Fig. 8 of Jurgensen I to the source vapor supply line 5 of Jurgensen II or the source vapor supply line 19 of Gartner, for the desirable purpose of reducing partial pressure of the source vapor in the source vapor supply line as taught by Jurgensen I. Also, the step of controlling the partial pressure downstream of the vaporizer as taught by Jurgensen I inherently meets the recited limitation of "to control pressure of the process chamber".

Claim 2 is rejected under 35 U.S.C. 103(a) as obvious over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790) for the reasons stated in the rejection of claim 1 above, and taken in further view of Ohashi (6,059,885) (see Figs. 2-10, and col. 14, lines 59-60, for example) or Nguyen (6,444,039) (see Figs. 2 and 6 and col. 2, lines 8-15, for example), each of whom teaches the use of a shower curtain installed between a shower head and a substrate holder in a vapor deposition apparatus, wherein the shower curtain surrounds the substrate holder to improve the gas flow or protect the process chamber walls, and for those reasons it would have been obvious to use such a shower curtain in the vapor deposition apparatus of Jurgensen I. Baek (5,670,218), cited by Nguyen, is cited of interest.

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Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790) for the reasons stated in the rejection of claim 1 above, and taken in further view of Ozias (4,846,102) (col. 2, lines 15-21) who teaches that vapor coating reactors are typically flushed after a coating process. It would have been obvious to one skilled in the art to purge after deposition in Jurgensen's coating apparatus for the desirable purpose of flushing unwanted gases from the reaction chamber.

Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jurgensen I (WO 01/61071) taken in view of Jurgensen II (WO 02/27064) and/or Gartner (4,947,790) for the reasons stated in the rejection of claim 1 above, and taken in view of Forrest I (5,554,220), Forrest II (6,337,102) and Posa (4,747,367). Forrest I (col. 7, lines 60-67) and Forrest II (col. 3, lines 48-61) teach that it is desirable to switch the gas flows in an OVPD process for depositing plural separate layers, and for that reason it would have been obvious to do so in Jurgensen's OVPD reactor. Furthermore, Posa teaches that a vapor coating reactor that is used for depositing plural separate layers should be flushed at the end of each separate gas flow. In view of Posa, it would have been obvious to purge Jurgensen's chamber after the end of each separate gas flow.

Applicants have argued that they have reviewed the cited references but have not been able to locate any reference to the diluted gas supply source recited in cancelled claim 7. It is noted, however, that claim 13 of Jurgensen I clearly describes a

"diluted gas supply source, from which diluted gas is supplied along with organic source vapors to the process chamber" as was recited in cancelled claim 7.

Applicants have argued that the conic gas distributor plate of Jurgensen II is located in the process chamber. It is noted, however, that the statement of the rejection in the previous office action identified Fig. 4 of Jurgensen II as illustrating a conic plate. The conic plate 16 of Fig. 4 of Jurgensen II is installed in the vaporizer (i.e. the source chamber of applicants' claim 1), and is not installed in the coating chamber (i.e. the process chamber of applicants' claim 1). Jurgensen II in para. 20 states that plate 16 of Fig. 4 is conical in form.

Applicants' arguments regarding Gartner are not persuasive. Gartner teaches the use of a conic plate installed in his vaporizer, wherein the conic plate is a transfer gas distributor, as recited in applicants' claim 1.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

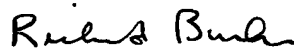
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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Bueker whose telephone number is (571) 272-1431. The examiner can normally be reached on 9 AM - 5:30 PM, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parvis Hassanzadeh can be reached on (571) 272-1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Richard Bueker
Primary Examiner
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